MF30 Series

User's Manual

NO.: G03-MF30-F

Revision: 2.0

Release date: June 18, 2024

Trademark:

Environmental Protection Announcement

Do not dispose this electronic device into the trash while discarding. To minimize pollution and ensure environment protection of mother earth, please recycle.

TABLE OF CONTENT

⚠️ Environmental Safety Instruction

- Avoid the dusty, humidity and temperature extremes. Do not place the product in any area where it may become wet.

- 0 to 60 centigrade is the suitable temperature. (The figure comes from the request of the main chipset)

- Generally speaking, dramatic changes in temperature may lead to contact malfunction and crackles due to constant thermal expansion and contraction from the welding spots' that connect components and PCB. Computer should go through an adaptive phase before it boots when it is moved from a cold environment to a warmer one to avoid condensation phenomenon. These water drops attached on PCB or the surface of the components can bring about phenomena as minor as computer instability resulted from corrosion and oxidation from components and PCB or as major as short circuit that can burn the components. Suggest starting the computer until the temperature goes up.

- The increasing temperature of the capacitor may decrease the life of computer. Using the close case may decrease the life of other device because the higher temperature in the inner of the case.

- Attention to the heat sink when you over-clocking. The higher temperature may decrease the life of the device and burned the capacitor.

USER'S NOTICE

Manual Revision Information

Reversion	Revision History	Date
2.0	Second Edition	June 18, 2024

Item Checklist

☑ Motherboard
☑ Cable(s)

Chapter 1
Introduction of the Motherboard

1-1 Feature of Motherboard

- Onboard 13th Generation Intel® Core™ /U-series Processor SoC (formerly Raptor Lake U), TDP 15 W, never denies high performance

- Support 2* DDR5 4800MHz Dual Channel SO-DIMM up to 64GB

- Integrated with 1* Intel® i226-V 2.5GbE, 1* Intel® i226-LM 2.5GbE

- 2* HDMI2.0b, 2* DP1.4, 1* Type-C DP1.4, 1* LVDS(or 1* 1-Lane eDP); support up to 4* independent 4K HDR Displays or 1* 8K SDR Display

- Onboard 1* M.2 M-key slot, type-2242/2280 (PCIe 4.0 x4) supports NVMe

- Onboard 1* M.2 E-key slot, type-2230 (USB2.0/PCIe 3.0x1) for Wi-Fi / Bluetooth supports Intel CNVi technology

- Onboard 1* M.2 B-key slot, type-3042/3052 (USB3.2 Gen.2/USB2.0/SATA/PCIe 3.0x1) support 4G/5G/LTE & 1* SIM card holder

- Onboard TPM2.0 (Option for **MF30-133E2 & MF30-133U2**)

- Support 1* SATAIII device

- Support 3* USB 3.2 Gen.2, 1* USB 3.2 Gen.2 Type-C supports DP ALT mode, 4* USB2.0

- Support 4* COM (***COM1/2 supports RS232/422/485**)

- Support 12V~36V DC-in

- Support Watchdog function

- Solution for Multiple Display Application

1-2 Specification

Spec	Description
Design	● 3.5" SBC; PCB size: 14.8x 10.2 cm
Embedded CPU	● Integrated with Intel® 13th Generation Intel® Core™ /U-series Processor SoC (formerly Raptor Lake U), Intel® CoreTM i5-1335UE **(TDP 15W)** * ***Note:*** *CPU model varies from different IPC options. Please consult your dealer for more information of onboard CPU.TDP varies depending on CPU.*
Memory Slot	● 2* DDR5 4800MHz SO-DIMM up to 64GB ● Support dual channel function ***Note:*** *For more memory compatibility information please consults your local dealer.*
Expansion Slot	● ***M2E1:*** 1* M.2 E-key type-2230 (USB2.0/PCIe 3.0x1) slot supports CNVi ● ***M2B1:*** 1 x B-key 3042/3052 (USB3.2/USB3.0) for 4G/5G/LTE OR 1 x B+M-key 2242 (SATA/PCIe 3x1) for SSD ● ***SIMCARD1:***1* Nano-SIM card slot; co-function with **M2B1 slot** ***Note:*** *when **M2B1** installed with **4G/5G/LTE module** compatible card should be inserted into **SIMCARD** socket.*
Storage	● ***SATA1:***1* SATAIII 6Gb/s port ● ***M2M2:*** 1* M.2 M-key type-2242/2280 (PCIe 4.0 x4) slot supports NVMe from CPU
LAN Chip	● ***UL1:***1* Intel **i226-V** LAN chip supports up to 2.5Gbps data transfer rate ● ***UL2***:1* Intel **i226-LM** LAN chip supports up to 2.5Gbps data transfer rate ● Support 10/100/1000/2500Mbps Ethernet data transfer rate ***Note: 2500Mbps** high-speed transmission rate is **only** supported over **CAT 5e UTP cable**.*
Audio Chip	● Integrated with Realtek HD audio chip
Graphics	***Intel® Iris Xe Graphics, shared memory for***: ● 2* HDMI2.0b ● 2* DP1.4 ● 1* Type-C DP1.4 ● 1* 24 bits Dual CH LVDS (or 1 * 1-lane eDP) ***Note:*** *Support 4 Displays.*

BIOS	● AMI Flash ROM
Rear I/O	● 1* Audio Line Out/MIC combo port ● 2* 2.5GbE RJ-45 LAN port ● 3* USB3.2 Gen.2 port ● 1* USB3.2 Gen. 2 Type-C supports DP ALT mode ● 2* DP1.4 ● 2* HDMI2.0b ● 1* 12V~36V DC-in power Jack *(*120W Power adapter is recommended for stable performance)*
Internal I/O	● 1* 3-pin internal AT/ATX power header ● 1* SATA power-out connector ● 1* CPU FAN header ● 1* CMOS battery connector ● 1* 3W amplifier header **(SPEAK_CON1)** ● 1* GPIO 8-bit/80 port header **(selectable by J80PORT1, default GPIO)** ● 2* 9-pin USB 2.0 header (Expansible to 4* USB 2.0 ports) ● 1* LAN LED activity LED header for 2* RJ-45 LAN Port ● 1* 24-bit dual channel LVDS **or** 1* 1-lane **eDP** header ● 1* LVDS_EDP inverter wafer ● 4* Serial port header (**COM1/2/3/4**; **COM1/2** supports RS232/422/485) ● 1* SMBUS header ● 1* Front panel header
TPM 2.0	● Optional for **MF30-133E2 & MF30-133U2 Series**

1-3 Layout Diagram

Rear IO Diagram:

2.5GbE
RJ-45 LAN Ports
(UL1 & UL2)

USB3.2
(Gen.2) Port
(USB2)

DP Ports

12~36V DC-In
Power Jack

Line-Out/MIC
Combo Port

USB3.2 (Gen.2)
Ports

USB3.2
(Gen.2) Port
Type-C
(TCP1)

HDMI Ports

Internal Diagram:

Speaker Wafer

LVDS Header (LVDS_EDP)

INVERTER1

SATA Power-Out Connector

SATAIII Port

Line-out/MIC Audio Combo Port

GPIO Port Header *(GPIO_CON1)*

LAN Active LED Header

M.2 E-key Slot (M2E1)

M.2 M-key Slot (M2M2)

2.5GbE RJ-45 LAN Port over USB3.2 (Gen 2) Port *(UL1)*

M.2 B-key Slot (M2B1)

Serial Port Headers (COM1/2/3/4)

2.5GbE RJ-45 LAN Port over USB3.2 (Gen 2) Port *(UL2)*

SIM Card Slot*(M2B1)*

CPUFAN Connector

USB 3.2 Gen 2 Port *(USB2)* over USB 3.2 Gen 2 Type-C Port *(TCP1)*

USB 2.0 Headers

SMBUS Header

DP over HDMI Port *(HDMI1-DP1)*

BATCON

2*DDR5 SODIMM Slots

DP over HDMI Port *(HDMI2-DP2)*

12V~36V DC-In Power Jack

Front Panel Header *(JW_FP1)*

Jumper Positions:

JP2

JP1

JPCOM1

JPCOM2

JME1

JCLR_CMOS

JCASE1

J80PORT1

JATX_AT1

Jumpers

Location	Name	Description	Pitch
JP2	LVDS_EDP PANEL VCC Select	4-Pin Block	2.0mm
JP1	INVERTER1 BACKLIGHT PWR Select	4-Pin Block	2.0mm
JPCOM1	COM1 Header Pin-9 Function Select	4-Pin Block	2.0mm
JPCOM2	COM2 Header Pin-9 Function Select	4-Pin Block	2.0mm
JME1	Flash Override	2-Pin Block	2.0mm
JCLR_CMOS	Clear CMOS	2-Pin Block	2.0mm
JCASE1	Case Open Display Select	2-Pin Block	2.0mm
J80PORT1	Short GPIO	2-Pin Block	2.0mm
JATX_AT1	ATX/AT Mode Select	3-Pin Block	2.0mm

Connectors

Location	Name
ADUIO1	Audio Line Out /MIC Combo Connector
UL1	**Top: i226-V** 2.5GbE RJ-45 LAN Port Connector **Bottom:** USB3.2 Gen. 2 Port Connector
UL2	**Top: i226-LM** 2.5GbE RJ-45 LAN Port Connector **Bottom:** USB 3.2 Gen. 2 Port Connector
USB2	USB3.2 Gen. 2 Port Connector
TCP1	USB3.2 Gen. 2 Type- C Port Connector
HDMI1-DP1/HDMI2-DP2	**Top:** DP1.4 Port Connector **Bottom:** HDMI2.0b Port Connector
DCIN3	12V~36V DC–In Power Jack
SATA1	SATAIII Port Connector
SATAPWR1	SATA Power out Connector
CPUFAN1	CPUFAN Connector
BATCON	CMOS Battery Connector

Headers & Wafers

Location	Name	Description	Pitch
SPEAK_CON1	3W Amplifier Header	4-pin Block	2.0mm
GPIO_CON1	GPIO Port Header	10-pin Block	2.0mm
FP_USB1/ FP_USB2	USB 2.0 Header	9-pin Block	2.0mm
JLANLED1	UL1/UL2 2.5GbE LAN Activity LED Header	4-pin Block	2.0mm
LVDS_EDP	LVDS/eDP Port Header	30-pin Block	1.25mm
INVERTER1	LVDS_EDP Inverter	8-pin Block	2.0mm
COM1/COM2	RS232/422/485 Serial Port Header	9-pin Block	2.0mm
COM3/COM4	RS232 Serial Port Header	9-pin Block	2.0mm
SMBUS1	SMBUS Header	5-pin Block	2.0mm
JW_FP	Front Panel Header (PWR LED/ HDD LED/Power Button /Reset)	9-pin Block	2.54mm

Chapter 2
Hardware Installation

2-1 Jumper Settings

JP2 (4-pin): LVDS_EDP PANEL VCC Select (2.0mm pitch)
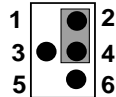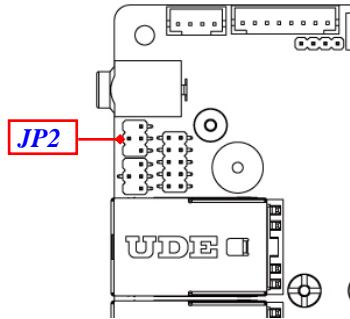
**2-4 Closed:
VCC= 3.3V
(Default);**
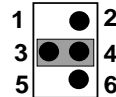
**3-4 Closed:
VCC= +5V;**
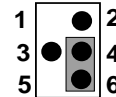
**4-6 Closed:
VCC= +12V.**

*Note: Maximum current limit is 2A while using 3.3V, 5V or 12V.

JP1 (4-pin): INVERTER BACKLIHGT PWR Select (2.0mm pitch)
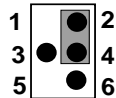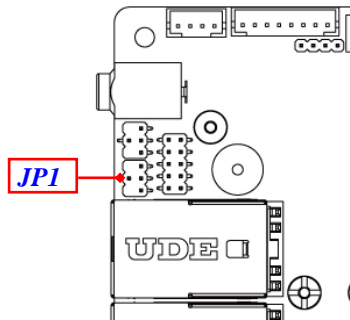
**2-4 Closed:
VCC= +5V
(Default);**
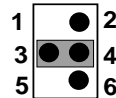
**3-4 Closed:
VCC= +12V;**
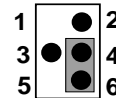
**4-6 Closed:
VCC=ADP12V.**

*Note: Maximum current limit is 2A while using 5V, 12V or adapter 12V.

JPCOM1 (4-pin): COM1 Header Pin-9 Function Select (2.0mm pitch)
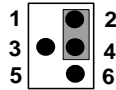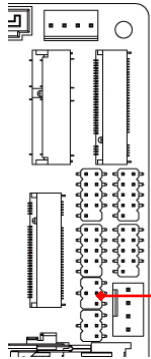
2-4 Closed:
RI=RS232
(Default);
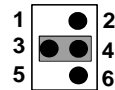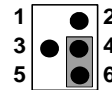
3-4 Closed:
RI=+5V;

4-6 Closed:
RI=+12V.

Note: Maximum current limit is 500mA while using 5V or 12V.

JPCOM2 (4-pin): COM2 Header Pin-9 Function Select (2.0mm pitch)
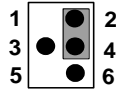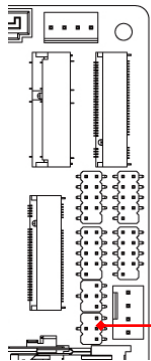
2-4 Closed:
RI=RS232
(Default);
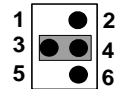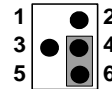
3-4 Closed:
RI=+5V;

4-6 Closed:
RI=+12V.

Note: Maximum current limit is 500mA while using 5V or 12V.

JME1 (2-pin): ME Flash Override Select (2.0mm pitch)

JME1
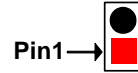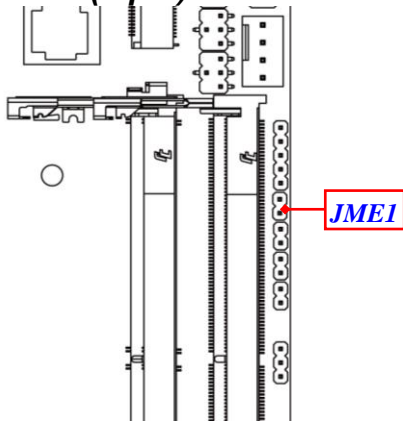
Pin1→ ⬛

1-2 Open: Normal (Default);
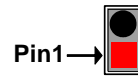
Pin1→ ⬛

1-2 Closed: ME Flash Override.

JCLR_CMOS (2-pin): Clear CMOS Settings (2.0mm pitch)

JCLR_CMOS
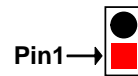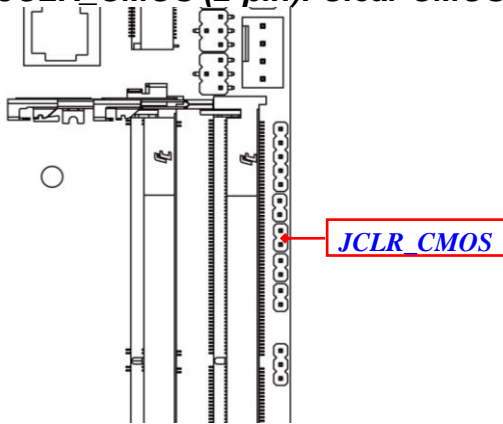
Pin1→ ⬛

1-2 Open: Normal (Default);
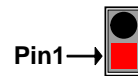
Pin1→ ⬛

1-2 Closed: Clear CMOS.

JCASE1 (2-pin): Case Open Message Display Function (2.0mm pitch)

GND
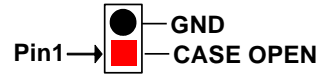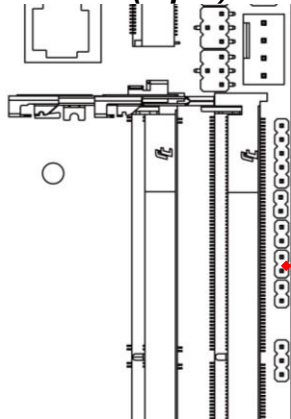
Pin1 → **CASE OPEN**

Default: Open.

Pin 1-2 Short: *When Case open function pin short to GND, the Case open function was detected. When Used, needs to enter BIOS and enable 'Case Open Detect' function. In this case if your case is removed, next time when you restart your computer, a message will be displayed on screen to inform you of this.*

J80PORT1 (2-pin): GPIO_CON1 80 Port/GPIO Function Select (2.0mm pitch)

GND

Pin1 →
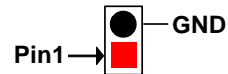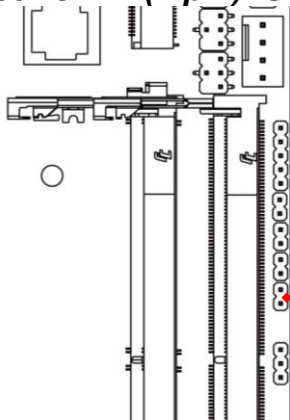
1-2 Open: GPIO_CON=80 Port;

GND

Pin1 →
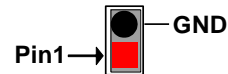
1-2 Closed: GPIO_CON=GPIO Port (Default)

***Note**: Maximum current limit is **1.0A** while using 5V working voltage.*

JATX_AT1 (3-pin): AT Mode /ATX Mode Select (2.0mm pitch)

3

1
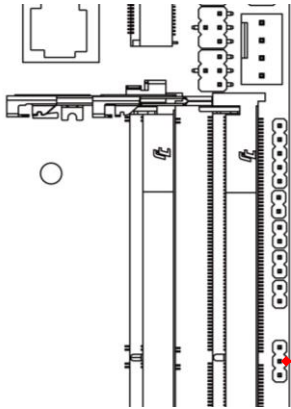
1-2 Closed: ATX Mode Selected (Default);

3

1

2-3 Closed: AT Mode Selected.

JATX_AT1

ATX Mode Selected: Press power button to power on after power input ready;
AT Mode Selected: Directly power on as power input ready.

2-2   Connectors, Headers and Wafers
2-2-1 Rear I/O Panel Connectors

Icon	*Name*	*Function*
	Audio Line-Out /MIC Combo Connector	This audio jack can function as audio Line-out & MIC-in combo connector with compatible cable connection.
	Top: 2.5Gbps RJ-45 LAN Port **Bottom: Type-A USB3.2 Gen. 2 Port**	**RJ-45 LAN Port:** This connector is standard RJ-45 LAN jack for Network connection which supports10/100/1000/2500 Mbps Ethernet data transfer rate *(*Note: 2.5Gbps is only supported with CAT 5e UTP cable).* **Type-A USB3.2 Gen.2 Port:** to connect USB keyboard, mouse or other devices compatible with USB3.2 Gen.2 specification. Ports support up to 10Gbps data transfer rate. **Note: Maximum current limit is 1.5A while using 5V working voltage*

	Top: Type-A USB3.2 Gen. 2 Port **Bottom: Type-C USB3.2 Gen. 2 Port**	**Type-A USB3.2 Gen.2 Port:** to connect USB keyboard, mouse or other devices compatible with USB3.2 Gen. 2 specification. Ports support up to 10Gbps data transfer rate. **Type-C USB3.2 Gen. 2 Port**: also **supports DP ALT mode & PD 5V/3A.**
	Top: DP Port **Bottom: HDMI Port**	**DP port:** to the system to corresponding display device with compatible DP cable. **HDMI port:** to connect display device that support HDMI specification.
	12V~36V DC-in Power Jack	For user to connect compatible power adapter to provide power supply for the system.

(1) DCIN3 (4-pin): Mini-DIN 12~36V Wide-Voltage DC-In Power Connector
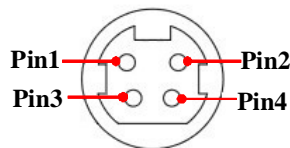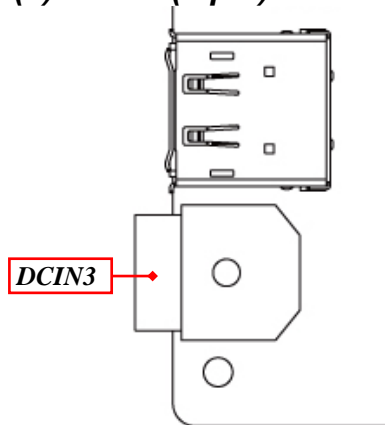
Pin No.	Definition
1	+12V~36V DC_IN
2	+12V~36V DC_IN
3	GND
4	GND

(2) 2.5GbE RJ-45 Ethernet Connectors

*** There are two LED next to the RJ-45 LAN port. Please refer to the table below for LAN port LED indications.*
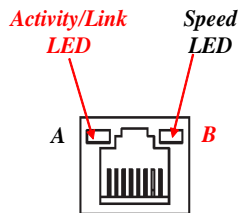
A: Activity/Link LED		B: Speed LED	
Status	**Description**	**Status**	**Description**
Off	No Link	Off	10/100Mbps connection
Blinking	Data Activity	**Orange**	1000Mbps connection
On	Link	**Green**	2.5Gbps connection

*** Note:** *2.5Gbps* high-speed transmission rate is **only** supported over **CAT 5e UTP cable**.

2-2-2 Motherboard Internal Connectors

(1) SATA1 (7-pin): SATAIII Port connector

This is a high-speed SATAIII port that supports 6GB/s transfer rate.

Pin No.	Definition
1	GND
2	TXP
3	TXN
4	GND
5	RXN
6	RXP
7	GND
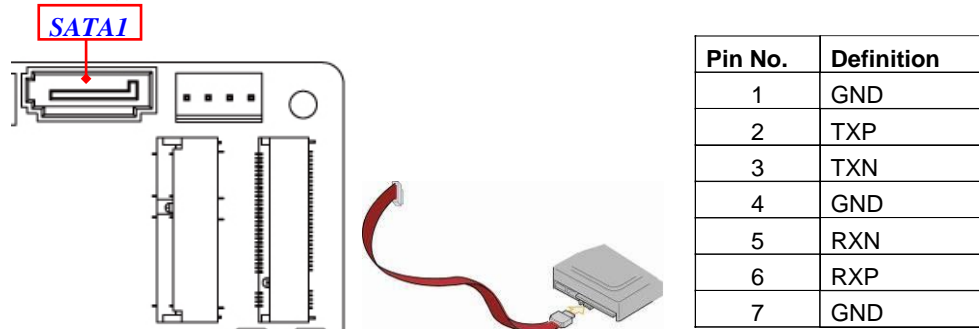
(2) SATAPWR1 (4-pin): SATA HDD Power-Out Connector

Warning: *Make sure that Pin-1 of compatible SATA Power out connector is inserted into corresponding Pin-1 of **SATAPWR1** connector to avoid possible damage to the board and hard disk driver!*

SATAPWR1

Pin1

+12V
GND
GND
+5V
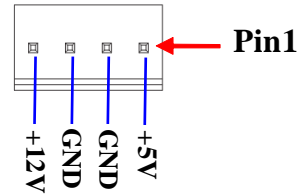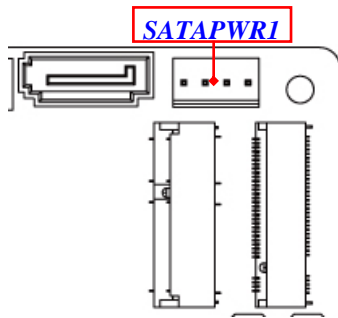
(3) CPUFAN1 (4-pin): CPU FAN Connector

Pin1

GND
+12V Fan Power
Fan Speed
Control

CPUFAN1
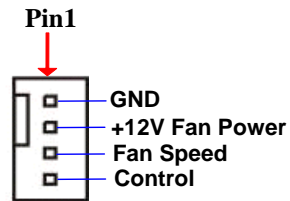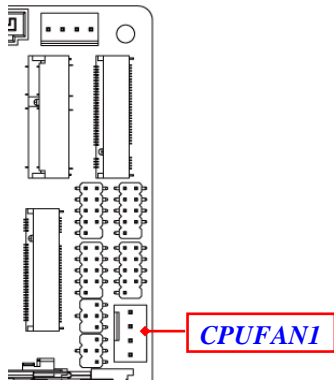
Note: Maximum current limit is 1.5A while using 12V working voltage.

(4) BATCON (2-pin): CMOS Battery Connector

BATCON

-
+
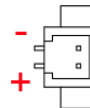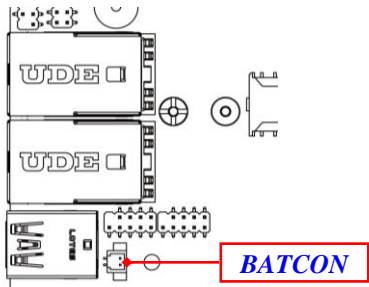
2-2-3 Pin Definition for Headers & Wafers
SPEAK_CON1 (4-pin): 3W Amplifier Wafer (2.0mm pitch)

SPEAK_CON1

Pin1
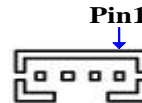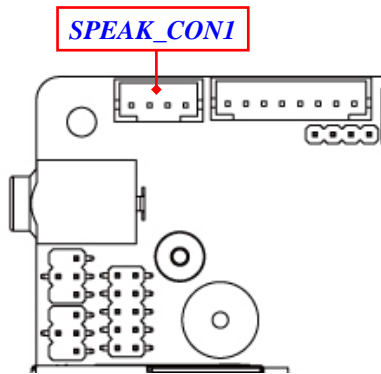
Pin No.	Definition
1	L-
2	L+
3	R+
4	R-

GPIO_CON1 (10-pin): GPIO 8-bit Port or 80 Port Header (2.0mm pitch)

GPIO_CON1

Pin1

SIO_GPIO80	SIO_GPIO81
SIO_GPIO82	SIO_GPIO83
SIO_GPIO84	SIO_GPIO85
SIO_GPIO86	SIO_GPIO87
GND	VCC
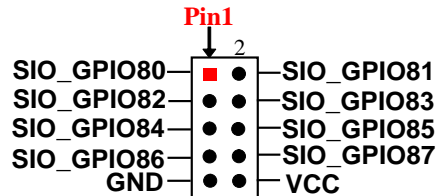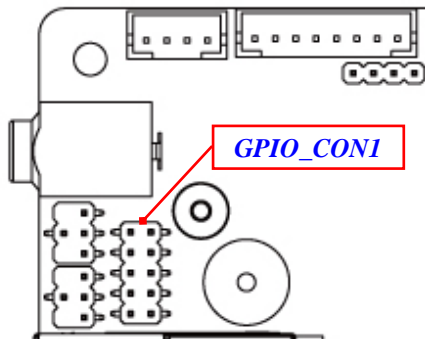
J80PORT Closed: Normal 8-bit GPIO;
J80PORT Open: For 80Port Function.

Note: **1.Maximum current limit is 1.0A while using 5V working voltage; **2.** Please refer to **Page-12** **J80PORT1** jumper settings for **GPIO_CON1 80Port** or **GPIO Port** function select.*

FP_USB1/FP_USB2 (9-pin): USB2.0 Header (2.0mm pitch)
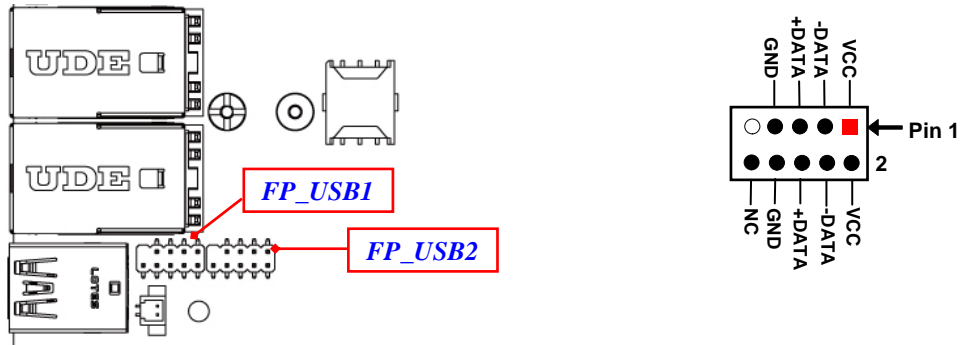
Note: Maximum current limit is 1.0A in total while using 5V working voltage.

JLANLED1 (4-pin): LAN Activity LED Header (2.0mm pitch)
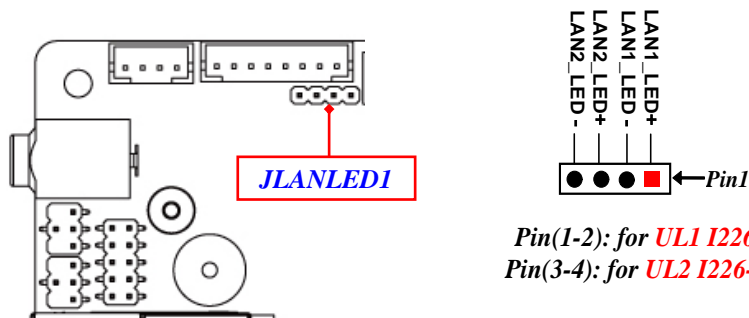
Pin(1-2): for UL1 I226-V LAN ;
Pin(3-4): for UL2 I226-LM LAN .

Note: Maximum current limit is 300mA while using 3.3V working voltage.

LVDS_EDP (30-pin): 24-bit Dual Channel LVDS or 1-Lane eDP Header (1.25mm pitch)
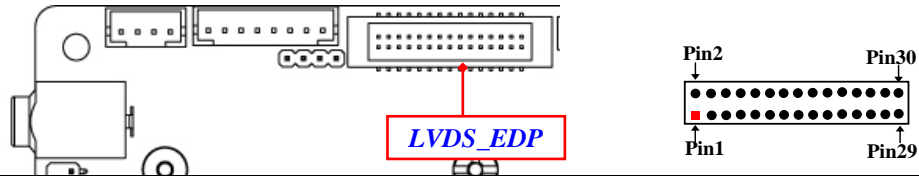
Pin Define	Pin No.	Pin No.	Pin Define
LVDSB_DATAN3	Pin 1	Pin 2	LVDSB_DATAP3
LVDS_CLKBN	Pin 3	Pin 4	LVDS_CLKBP
LVDSB_DATAN2	Pin 5	Pin 6	LVDSB_DATAP2
LVDSB_DATAN1	Pin 7	Pin 8	LVDSB_DATAP1
LVDSB_DATAN0	Pin 9	Pin 10	LVDSB_DATAP0
CH_SDA	Pin 11	Pin 12	CH_SCL
GND	Pin 13	Pin 14	GND
GND	Pin 15	Pin 16	GND
LVDSA_DATAP3	Pin 17	Pin 18	LVDSA_DATAN3
LVDS_CLKAP/EDP_AUXP	Pin 19	Pin 20	LVDS_CLKAN/EDP_AUXN
LVDSA_DATAP2/EDP_TX0P	Pin 21	Pin 22	LVDSA_DATAN2/EDP_TX0N
LVDSA_DATAP0/EDP_TX1P	Pin 23	Pin 24	LVDSA_DATAN1/EDP_TX1N
LVDSA_DATAP0	Pin 25	Pin 26	LVDSA_DATAN0
LCD_VCC	Pin 27	Pin 28	LCD_VCC
LCD_VCC	Pin 29	Pin 30	LCD_VCC

Note: Please follow the settings of jumper JP2 for LVDS panel power VCC.

INVERTER1 (8-pin): LVDS Inverter Connector (2.0mm pitch)
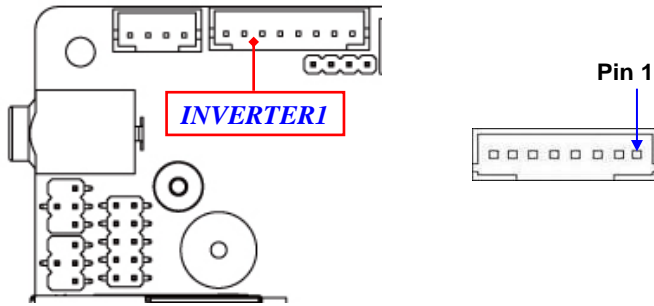
Pin No.	Definition
1	Backlight Enable
2	Backlight PWM
3	Back Light LED VCC
4	Back Light LED VCC
5	GND
6	GND
7	Backlight Up SW
8	Backlight Down SW

*__*Note:__ Maximum current limit is 2A while using 5V or 12V or adapter 12V.*

COM1/2/3/4 (9-pin): Serial Port Headers (2.0mm pitch)

COM1/2: RS232/422/485 Serial Port Header.
COM3/4: RS232 Serial Port Header.
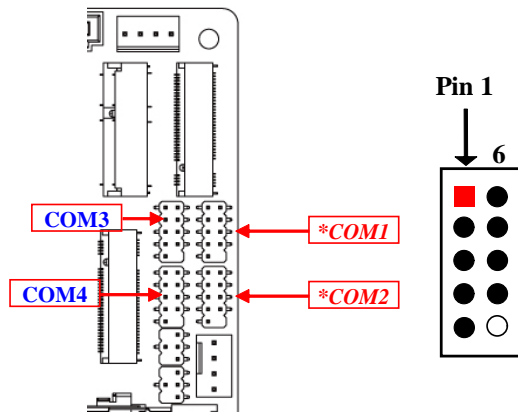
Pin NO.	RS232	*RS422 (COM1/2)	*RS485 (COM1/2)
Pin 1	DCD	TX-	DATA-
Pin 2	SIN-	TX+	DATA+
Pin 3	SO-	RX+	NC
Pin 4	DTR-	RX-	NC
Pin 5	GND	GND	GND
Pin 6	DSR-	NC	NC
Pin 7	RTS-	NC	NC
Pin 8	CTS-	NC	NC
Pin 9	RI-	NC	NC

*__*Note:__ **COM1& COM2 header can function as RS232/422/485 port header.** In normal settings **COM1 & COM2** function as RS232 header. With compatible COM cable connection **COM1 & COM2** can function as RS422 or RS 485 header. User also needs to go to BIOS to set '**Transmission Mode Select'** for COM1 or COM2 header (refer to **Page-33**) at first, before using specialized cable to connect different pins of this port.*

SMBUS1 (5-Pin): SMBUS Header (2.0mm pitch)

- VCC3
- GND
- SMBUS_ALERT
- SMBUS_DATA
- SMBUS_CLK

Pin 1
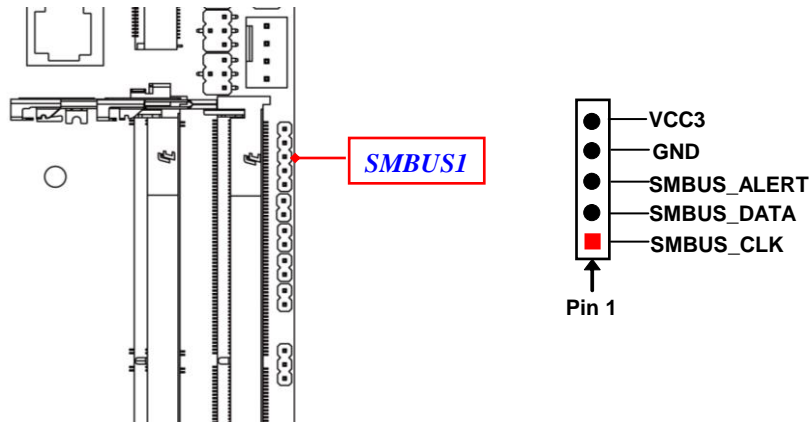
Note: Maximum current limit is 500mA while using 3V working voltage.

JW_FP1 (8-pin): Front Panel Header (2.54mm pitch)

PWR LED+
PWR LED-
PWRBTN
GND

2
Pin1

HDD LED+
HDD LED-
GND
RSTSW
VCC
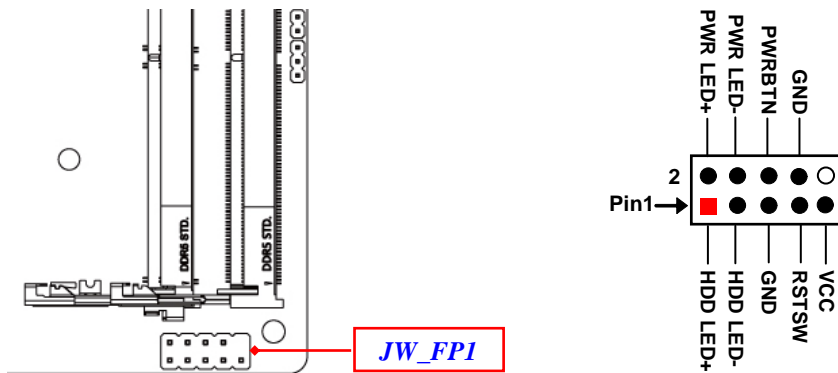
Note: Maximum current limit is 1A while using 5V working voltage.

2-3 Maximum Voltage & Current Limit

Below is a list of maximum voltage & Current Limit specification for motherboard interface (including but not limited to slots, connectors and headers) for setup reference:

Parts		Working Voltage	Current Support
USB Ports from	*UL1(Down)/ UL2(Down)*	5V	1.5A
	USB2	5V	1.5A
	TCP1	5V	3A
	FP_USB1/ FP_USB 2	5V	1.0A
COM1		5V/12V*(via JPCOM1)*	0.5A
COM2		5V/12V*(via JPCOM2)*	0.5A
SATAPWR1		5V	1.0A
CPUFAN1		12V	1.5A
JW_FP1		5V	1A
JLANLED1		3.3V	0.3A
GPIO_CON1		5V	1.0A
SMBUS1		5V	0.5A
LVDS_EDP		3.3V/5V/12V (via **JP2** setting)	2A
INVERTER1		5V/12V/ADP12V (via **JP1** setting)	2A

Chapter 3
Introducing BIOS

Notice!	The BIOS options in this manual are for reference only. Different configurations may lead to difference in BIOS screen and BIOS screens in manuals are usually the first BIOS version when the board is released and may be different from your purchased motherboard. Users are welcome to download the latest BIOS version form our official website.

The BIOS is a program located on a Flash Memory on the motherboard. This program is a bridge between motherboard and operating system. When you start the computer, the BIOS program will gain control. The BIOS first operates an auto-diagnostic test called POST (power on self test) for all the necessary hardware, it detects the entire hardware device and configures the parameters of the hardware synchronization. Only when these tasks are completed done it gives up control of the computer to operating system (OS). Since the BIOS is the only channel for hardware and software to communicate, it is the key factor for system stability, and in ensuring that your system performance as its best.

3-1 Entering Setup

Power on the computer and by pressing <Del> immediately allows you to enter Setup. If the message disappears before your respond and you still wish to enter Setup, restart the system to try again by turning it OFF then ON or pressing the "RESET" button on the system case. You may also restart by simultaneously pressing <Ctrl>, <Alt> and <Delete> keys.   If you do not press the keys at the correct time and the system does not boot, an error message will be displayed and you will again be asked to

    Press   **<Del>** to enter Setup; press < **F7**> to enter pop-up Boot menu.

BIOS Boot Menu Screen (boot device options please refer to actual configuration)

3-2 BIOS Menu Screen

The following diagram show a general BIOS menu screen:

Menu Bar

```
                            Aptio Setup – AMI
   Main  Advanced  Chipset  Security  Boot  Save & Exit  MEBx

  BIOS Information                                          Choose the system default
  BIOS Vendor                   American Megatrends         language
  Core Version                  5.27
  Filename                      FAMFYA01
  Build Date and Time           05/09/2024 16:04:22
  Access Level                  Administrator

  ME FW Version                 16.1.30.2330

  System Language               [English]

  System Date                   [Tue 05/14/2024]           →+: Select Screen
  System Time                   [11:46:10]                 ↑↓: Select Item
                                                           Enter: Select
                                                           +/-: Change Opt.
                                                           F1: General Help
                                                           F2: Previous Values
                                                           F3: Optimized Defaults
                                                           F4: Save & Exit
                                                           ESC: Exit


                    Version 2.22.1292 Copyright (C) 2024 AMI
```

General Help Items

Current Setting Value

Menu Items

Function Keys

3-3 Function Keys

In the above BIOS Setup main menu of, you can see several options. We will explain these options step by step in the following pages of this chapter, but let us first see a short description of the function keys you may use here:

● Press←→ (left, right) to select screen.

- Press ↑↓ (up, down) to choose, in the main menu, the option you want to confirm or to modify.
- Press <Enter> to select.
- Press <+>/<−> keys when you want to modify the BIOS parameters for the active option.
- [F1]: General help.
- [F2]: Previous values.
- [F3]: Optimized defaults.
- [F4]: Save & Exit.
- Press <Esc> to exit from BIOS Setup.

3-4 Getting Help

Main Menu

The on-line description of the highlighted setup function is displayed at the top right corner the screen.

Status Page Setup Menu/Option Page Setup Menu

Press【**F1**】to pop up a small help window that describes the appropriate keys to use and the possible selections for the highlighted item. To exit the Help Window, press <**Esc**>.

3-5 Menu Bars

There are six menu bars on top of BIOS screen:

Main	To change system basic configuration
Advanced	To change system advanced configuration
Chipset	To change chipset configuration
Security	Password settings
Boot	To change boot settings
Save & Exit	Save setting, loading and exit options.

User can press the right or left arrow key on the keyboard to switch from menu bar. The selected one is highlighted.

3-6 Main Menu

Main menu screen includes some basic system information. Highlight the item and then use the <+> or <-> and numerical keyboard keys to select the value you want in each item.

```
                            Aptio Setup - AMI
  Main  Advanced  Chipset  Security  Boot  Save & Exit  MEBx

  BIOS Information                                    Choose the system default
  BIOS Vendor                 American Megatrends     language
  Core Version                5.27
  Filename                    FAMFYA01
  Build Date and Time         05/09/2024 16:04:22
  Access Level                Administrator

  ME FW Version               16.1.30.2330

  System Language             [English]

  System Date                 [Tue 05/14/2024]
  System Time                 [11:46:10]
                                                    →←: Select Screen
                                                    ↑↓: Select Item
                                                    Enter: Select
                                                    +/-: Change Opt.
                                                    F1: General Help
                                                    F2: Previous Values
                                                    F3: Optimized Defaults
                                                    F4: Save & Exit
                                                    ESC: Exit


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```

System Date
Set the date. Please use [Tab] to switch between date elements.
System Time
Set the time. Please use [Tab] to switch between time elements.

3-7 Advanced Menu


```
                          Aptio Setup - AMI
    Main  Advanced  Chipset  Security  Boot  Save & Exit  MEBx

  ▶ Connectivity Configuration              Configure Connectivity related
  ▶ CPU Configuration                       options
  ▶ Power & Performance
  ▶ Trusted Computing
  ▶ ACPI Settings
  ▶ Super IO Configuration
  ▶ Serial Port Console Redirection
  ▶ PC Health Status
  ▶ USB Configuration
  ▶ Network Stack Configuration
  ▶ NVMe Configuration
  ▶ Wake-up Function Settings
  ▶ PTT Configuration
                                            _____
                                            ↔: Select Screen
                                            ↑↓: Select Item
                                            Enter: Select
                                            +/-: Change Opt.
                                            F1: General Help
                                            F2: Previous Values
                                            F3: Optimized Defaults
                                            F4: Save & Exit
                                            ESC: Exit

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```

▶ **Connectivity Configuration**

Use this item to configure Connectivity related options. Press [Enter] to make settings for the following sub-items:

CNVi CRF Present

CNVi Mode

This option configures Connectivity.

CNVi Mode Set the default value to: [Auto Detection].

The optional settings: [Disabled Integrated]; [Auto Detection].

[Auto Detection] means that if Discrete solution is discovered it will be enabled by default. Otherwise Integrated solution (CNVi) will be enabled;

[Disabled Integrated] disables Integrated Solution.

▶ **CPU Configuration**

Press [Enter] to view current CPU configuration and make settings for the following sub-items:

▶ **Efficient-Core Information**

Use this item to displays the E-Core information.

Press [Enter] to make settings for the following sub-items:

L1 Date Cache/L1 Instruction Cache/L2 Cache/L3 Cache

▶ **Performance-Core Information**

Use this item to displays the P-Core information.

Press [Enter] to make settings for the following sub-items:

L1 Date Cache/L1 Instruction Cache/L2 Cache/L3 Cache

Boot Performance Mode

Use this item to select the performance state that the BIOS will set starting from reset vertor.

Boot Performance Mode Set the default value to: [Turbo Performance].

The optional settings: [Max Battery]; [Max Non-Turbo Performance]; [Turbo Performance].

Intel(R) SpeedStep(tm)

This item allows more than two frequency ranges to be supported.

Intel(R) SpeedStep(tm) Set the default value to: [Enabled]

The optional settings: [Disabled]; [Enabled].

Turbo Mode

Use this item to enable or disable processor Turbo Mode (requires Intel Speed Step or Intel Speed Shift to be available and enabled).

Turbo Mode Set the default value to: [Enabled]

The optional settings: [Disabled]; [Enabled].

Note: 'Turbo Mode' is only for MF30 single board model；Disabled only for Barebone model used).

C states

Use this item to enable or disable CPU Power Management. When set as

[Enabled], it allows CPU to go to C states when it's not 100% utilized.

C states Set the default value to: [Enabled].

The optional settings: [Disabled]; [Enabled].

Enhanced C-states

Use this item to Enable/Disable C1E. When enabled, CPU will switch to minimum speed when all cores enter C-State.

Enhanced C-states Set the default value to: [Enabled].

The optional settings: [Disabled]; [Enabled].

Package C State Limit

Use this item to maximum package C State Limit setting. CPU default: leaves to factory default value. Auto: initializes to deepest available package C State Limit.

Package C State Limit Set the default value to: [Auto].

The optional settings: [C0/C1]; [C2]; [C3] ; [C6] ; [C7] ; [C7S] ; [C8] ; [C9] ; [C10] ; [CPU Default] ; [Auto].

▸ **Power & Performance**

Press [Enter] to make settings for the following sub-items:

Power & Performance

▸ **CPU – Power Management Control**

CPU-Power Management Control Options.

Press [Enter] to make settings for the following sub-items:

Power Limit 1

Use this item to set Power Limit 1 in Milli Watts. BIOS will round to the nearest 1/8W when programming.

0 = no custom override. For 12.50W, enter 12500.

Overclocking SKU: Value must be between Max and Min Power Limits (specified by PACKAGE_POWER_SKU_MSR).

Other SKUs: This value must be between Min Power Limit and Processor Base Power (TDP) Limit. If value is 0, BIOS will program Processor Base Power (TDP) value.

Power Limit 1 Set the default value to: [0].

Power Limit 1 Time Window

Use this item to set Power Limit 1 Time Window value in seconds. The value may vary from 0 to 128. 0 = default value (28 sec for Mobile and 8 sec for Desktop). Defines time window which Processor Base Power (TDP) value should be maintained.

Power Limit 1 Time Window Set the default value to: [0].

The optional settings are: [0]; [1]; [2]; [3]; [4]; [5]; [6]; [7]; [8]; [10]; [12]; [14]; [16]; [20]; [24]; [28]; [32]; [40]; [48]; [56]; [64]; [80]; [96]; [112]; [128].

Power Limit 2

Use this item to set Power Limit 2 Value in Milli Watts. BIOS will round to the nearest 1/8W when programming.

0=no custom override. For 12.50w, enter 12500. Processor applies control policies such that the package power does not exceed this limit.

Power Limit 2 Set the default value to: [0].

Power Limit 4 Override

Use this item to enabled/disable power Limit 4 override. If this option is disabled, BIOS will program the default values for Power Limit 4.

Power Limit 4 Override Set the default value to: [Disabled].

The optional settings: [Disabled]; [Enabled].

When set as [Enabled], user can make further settings in the following items:

Power Limit 4

Use this item to power Limit 4 in Milli watts. BIOS will round to the nearest 1/8W when programming. For 12.50W, enter 12500. If the value is 0, BIOS leaves default..

Power Limit 4 Set the default value to: [0].

▸ **GT-Power Management Control**

Press [Enter] to make settings for the following sub-items:

RC6(Render Standby)

Use this item to check to enable render standby support.

RC6(Render Standby) Set the default value to: [Enabled].

The optional settings: [Disabled]; [Enabled].

Maximum GT frequency
Use this item to Maximum GT frequency limited by the user. Choose between 200MHZ (RPN) and 1200MHZ (RP0). Value beyond the range will be clipped to min/max supported by SKU.
Maximum GT frequency Set the default value to: [Default Max Frequency].
The optional settings: [Default Max Frequency]; [100Mhz] ; [150Mhz] ; [200Mhz] ; [250Mhz] ; [300Mhz] ; [350Mhz] ; [400Mhz] ; [450Mhz] ; [500Mhz] ; [550Mhz] ; [600Mhz] ; [650Mhz] ; [700Mhz] ; [750Mhz] ; [800Mhz] ; [850Mhz] ; [900Mhz] ; [950Mhz] ; [1000Mhz] ; [1050Mhz] ; [1100Mhz] ; [1150Mhz] ; [1200Mhz] ;
Disable Turbo GT frequency
Use this item to enabled: disables turbo GT frequency. Disabled: GT frequency is not limited
Disable Turbo GT frequency Set the default value to: [Disabled].
The optional settings: [Disabled]; [Enabled].

▶ **Trusted Computing**
Press [Enter] to make settings in the following sub-items:
Security Device Support
Use this item to enables or disables BIOS support for security device. O.S will not show security device. TCG EFI protocol and INT1A interface will not be available.
The optional settings: [Disabled]; [Enabled].
Security Device Support Set the default value to: [Enabled].
When set as [Enabled], user can make setting in the following items that appear:
SHA256 PCR Bank
Use this item to enable or disable SHA256 PCR Bank.
The optional settings: [Disabled]; [Enabled].
SHA256 PCR Bank Set the default value to: [Enabled].
SHA384 PCR Bank
Use this item to enable or disable SHA384 PCR Bank.
The optional settings: [Disabled]; [Enabled].
SHA384 PCR Bank Set the default value to: [Disabled]
SHA3_256 PCR Bank

Use this item to enable or disable SM3_256 PCR Bank.

The optional settings: [Disabled]; [Enabled].

SHA384 PCR Bank Set the default value to: [Disabled]

Pending Operation

Use this item to schedule an operation for security device.

The optional settings: [None]; [TPM Clear].

Pending Operation Set the default value to: [None].

Note: **Your computer will reboot during restart in order to change State of Security Device.

▸ **ACPI Settings**

Press [Enter] to make settings for the following sub-items:

ACPI Settings

ACPI Sleep State

Use this item to select the highest ACPI sleep state the system will enter when the SUSPEND button is pressed.

The optional settings are: [Suspend Disabled]; [S3 (Suspend to RAM)].

ACPI Sleep State Set the default value to: [S3 (Suspend to RAM)].

▸ **Super IO Configuration**

Press [Enter] to make settings for the following sub-items:

Super IO Configuration

▸ **Serial Port 1 Configuration**

Press [Enter] to make settings for the following items:

Serial Port

Use this item to enable or disable serial port (COM).

The optional settings: [Disabled]; [Enabled].

Serial Port Set the default value to: [Enabled].

When set as [Enabled], user can make settings in the following items that appear:

Change Settings

Use this item to select an optimal settings for super IO device.

The optional settings are: [Auto]; [IO=3F8h; IRQ=4]; [IO=2F8h; IRQ=3]; [IO=3E8h;

IRQ=4]; [IO=2E8h; IRQ=3];
Change Settings Set the default value to: [Auto].
Transmission Mode Select
The optional settings are: [RS422]; [RS232]; [[RS485].
Transmission Mode Select Set the default value to: [RS232].
Mode Speed Select
Use this item to RS232/RS422/RS485 Speed Select.
The optional settings are: [RS232/RS422/RS485=250Kbps]; [RS232=1Mbps, RS422/RS485=10Mbps];
Mode Speed Select Set the default value to: [RS232=1Mbps, RS422/RS485=10Mbps].

▸ **Serial Port 2 Configuration**
Press [Enter] to make settings for the following items:
Serial Port
Use this item to enable or disable serial port (COM).
The optional settings: [Disabled]; [Enabled].
Serial Port Select Set the default value to: [Enabled].
When set as [Enabled], user can make settings in the following items that appear:
Change Settings
Use this item to select an optimal setting for super IO device.
The optional settings are: [Auto]; [IO=3F8h; IRQ=4]; [IO=2F8h; IRQ=3]; [IO=3E8h; IRQ=4]; [IO=2E8h; IRQ=3];
Change Settings Set the default value to: [Auto].
Transmission Mode Select
The optional settings are: [RS422]; [RS232]; [[RS485].
Transmission Mode Select Set the default value to: [RS232].
Mode Speed Select
Use this item to RS232/RS422/RS485 Speed Select.
The optional settings are: [RS232/RS422/RS485=250Kbps]; [RS232=1Mbps, RS422/RS485=10Mbps];
Mode Speed Select Set the default value to: [RS232=1Mbps,

RS422/RS485=10Mbps].
- ▶ **Serial Port 3 Configuration**
  Press [Enter] to make settings for the following items:
  Serial Port
  Use this item to enable or disable serial port (COM).
  The optional settings: [Disabled]; [Enabled].
  Serial Port Select Set the default value to: [Enabled].
  When set as [Enabled], user can make settings in the following items that appear:
  Change Settings
  Use this item to select an optimal setting for super IO device.
  The optional settings are: [Auto]; [IO=3F8h; IRQ=10]; [IO=2F8h; IRQ=10]; [IO=3E8h; IRQ=10]; [IO=2E8h; IRQ=10]; [IO=2F0h; IRQ=10]; [IO=2E0h; IRQ=10]; Change Settings Set the default value to: [Auto].
- ▶ **Serial Port 4 Configuration**
  Press [Enter] to make settings for the following items:
  Serial Port
  Use this item to enable or disable serial port (COM).
  The optional settings: [Disabled]; [Enabled].
  Serial Port Select Set the default value to: [Enabled].
  When set as [Enabled], user can make settings in the following items that appear:
  Change Settings
  Use this item to select an optimal setting for super IO device.
  The optional settings are: [Auto]; [IO=3F8h; IRQ=10]; [IO=2F8h; IRQ=10]; [IO=3E8h; IRQ=10]; [IO=2E8h; IRQ=10]; [IO=2F0h; IRQ=10]; [IO=2E0h; IRQ=10]; Change Settings Set the default value to: [Auto].

ERP Support
Use this item to make setting for energy-related products function. Disable ERP to active all wake-up function.
The optional settings: [Disabled]; [Enabled].
ERP Support Set the default value to: [Disabled]

Case Open Detect

Use this item to detect if case have ever been opened. Show message in POST. The optional settings: [Disabled]; [Enabled].
Case Open Detect Set the default value to: [Disabled]
When set as [Enabled], system will detect if COPEN has been short or not (*refer to JCASE1 jumper setting for Case Open Detection*); if Pin 1&2 of **JCASE1** are short, system will show Case Open Message during POST.

WatchDog Reset Timer
Use this item to support WDT reset function.
The optional settings: [Disabled]; [Enabled].
WatchDog Reset Timer Set the default value to: [Disabled].
When set as [Enabled], user can make settings in the following items that appear:
WatchDog Reset Timer Value
User can set a value in the range of [10] to [255] seconds or [1] to [255] minutes.
WatchDog Reset Timer Value Set the default value to: [10].
WatchDog Reset Timer Unit
The optional settings are: [Sec.]; [Min.].
WatchDog Reset Timer Unit Set the default value to: [Sec].
WatchDog Wake-up Timer
Use this item to support WDT Wake-up.
The optional settings are: [Disabled]; [Enabled].
WatchDog Wake-up Timer Set the default value to: [Disabled]
When set as [Enabled], user can make settings in the following items that appear:
WatchDog Wake-up Timer Value
User can set a value in the range of [10]~[4095] seconds, or [1]~[4095] minutes.
WatchDog Reset Timer Value Set the default value to: [10].
WatchDog Wake-up Timer Unit
The optional settings are: [Sec.]; [Min.].
WatchDog Reset Timer Unit Set the default value to: [Sec].

ATX Power Emulate AT Power
This item support Emulate AT power function, MB power On/Off control by power

supply. Use needs to select 'AT or ATX Mode' on MB jumper at first (refer to **JATX_AT1** jumper setting Pin 1&2 of for **ATX Mode** & Pin 2&3 of **AT Mode** Select)

▸ **Serial Port Console Redirection**
Press [Enter] to make settings for the following sub-items:
COM1

Console Redirection
Console Redirection enable or disable.
The optional settings: [Disabled]; [Enabled].
Console Redirection Set the default value to: [Disabled]
When set as **[Enabled]**, user can make further settings in the '**Console Redirection Settings**' screen:

▸ **Console Redirection Settings**
The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.
Press [Enter] to make settings for the following sub-items：

Terminal Type
The optional settings: [VT100]; [VT100Plus]; [VT-UTF8]; [ANSI].
[ANSI]: Extended ASCII char set;
[VT100]: ASCII char set;
[VT100Plus]: Extends VT100 to support color, function keys, etc.
[VT-UTF8]: Uses UTF8 encoding to map Unicode chars onto 1 or more bytes.
Terminal Type Set the default value to: [ANSI].

Bits per second
Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
The optional settings: [9600]; [19200]; [38400]; [57600]; [115200].
Bits per second Set the default value to: [115200]

Data Bits
The optional settings: [7]; [8].
Data Bits Set the default value to: [8].
Parity
A parity bit can be sent with the data bits to detect some transmission errors.
The optional settings: [None]; [Even]; [Odd]; [Mark]; [Space].
[Even]: parity bit is 0 if the num of 1's in the data bits is even;
[Odd]: parity bit is 0 if num of 1's in the data bits is odd;
[Mark]: parity bit is always 1;
[Space]: parity bit is always 0;
Parity Set the default value to: [None].
[Mark] and **[Space]**: parity do not allow for error detection. They can be used as an additional data bit.
Stop Bits
Stop bits indicate the end of a serial data packet. (A start bit indicates the beginning). The standard setting is 1 stop bit. Communication with slow devices may require more than 1 stop bit.
The optional settings: [1]; [2].
Stop Bits Set the default value to: [1]
Flow Control
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
The optional settings: [None]; [Hardware RTS/CTS].
Flow Control Set the default value to: [None].
VT-UTF8 Combo Key Support
Use this item to enable VT-UTF8 Combination Key Support for ANSI/VT100 terminals.
The optional settings: [Disabled]; [Enabled].
VT-UTF8 Combo Key Support Set the default value to: [Enabled]

Recorder Mode

With this mode enabled only text will be sent. This is to capture Terminal data.

The optional settings: [Disabled]; [Enabled].

Recorder Mode Set the default value to: [Disabled].

Resolution 100x31

Use this item to enable or disable extended terminal resolution.

The optional settings: [Disabled]; [Enabled].

Resolution 100x31 Set the default value to: [Disabled].

Putty KeyPad

Use this item to select FunctionKey and KeyPad on Putty.

The optional settings: [VT100]; [LINUX]; [XTERMR6]; [SCO]; [ESCN]; [VT400].

Putty KeyPad Set the default value to: [VT100].

‣ **Legacy Console Redirection Settings**

Press [Enter] to make settings for the following items:

Redirection COM Port

Use this item to select a COM port to display redirection of Legacy OS and Legacy OPROM Messages

The optional settings: [COM1].

Redirection COM Port Set the default value to: [COM1].

Resolution

Use this item to on legacy OS, the number of rows and columns supported redirection

The optional settings: [80x24]; [80x25].

Resolution Set the default value to: [80x24].

Redirect After POST

When bootloader is selected, then legacy console redirection is disabled before booting to legacy OS. When always enable is selected, the legacy console redirection is enabled for legacy OS. Default setting for this option is set to always enable.

The optional settings: [Always Enable]; [BootLoader].

Redirect After POST Set the default value to: [Always Enable].

Serial Port for Out-of-Band Management/
Windows Emergency Management Services (EMS)

Console Redirection EMS
Use this item to enable or disable console redirection.
The optional settings: [Disabled]; [Enabled].
Console Redirection EMS Set the default value to: [Disabled].
When set as **[Enabled]**, user can make further settings in '**Console Redirection Settings**' screen:

▸ **Console Redirection Settings**

The settings specify how the host computer and the remote computer (which the user is using) will exchange data. Both computers should have the same or compatible settings.

Press [Enter] to make settings for the following sub-items.
Terminal Type EMS
The optional settings: [VT100]; [VT100Plus]; [VT-UTF8]; [ANSI].
[VT-UTF8] is the preferred terminal type for out-of-band management. The next best choice is **[VT100+]** and then **[VT100]**. See above, in Console Redirection Settings page, for more help with Terminal Type/Emulation.
Terminal Type EMS Set the default value to: [VT-UTF8]
Bits per second EMS
Use this item to select serial port transmission speed. The speed must be matched on the other side. Long or noisy lines may require lower speeds.
The optional settings: [9600]; [19200]; [57600]; [115200].
Bits per second EMS Set the default value to: [115200].
Flow Control EMS
Flow control can prevent data loss from buffer overflow. When sending data, if the receiving buffers are full, a "stop" signal can be sent to stop the data flow. Once the buffers are empty, a "start" signal can be sent to re-start the flow. Hardware flow control uses two wires to send start/stop signals.
The optional settings: [None]; [Hardware RTS/CTS]; [Software Xon/Xoff].

Flow Control EMS Set the default value to: [None].

Data Bits EMS
The default setting is: [8].
This item may or may not show up, depending on different configuration.

Parity EMS
The default setting is: [None].
This item may or may not show up, depending on different configuration.

Stop Bits EMS
The default setting is: [1].
This item may or may not show up, depending on different configuration.

‣ **PC Health Status**
Press [Enter] to view current hardware health status, make further settings in '**SmartFAN Configuration**' and set value in '**Shutdown Temperature**'.

‣ **SmartFAN Configuration**
Press [Enter] to make settings for SmartFAN Configuration:

SmartFAN Configuration

CPUFAN Smart Mode
The optional settings: [Disabled]; [Enabled].
CPUFAN Smart Mode Set the default value to: [Enabled].
When set as [Enabled], the following sub-items shall appear:

CPUFAN Full-Speed Temperature
Use this item to set CPUFAN full speed temperature. Fan will run at full speed when above this pre-set temperature.
CPUFAN Full-Speed Temperature Set the default value to: [75]

CPUFAN Full-Speed Duty
Use this item to set CPUFAN full-speed duty. Fan will run at full speed when above this pre-set duty.
CPUFAN Full-Speed Duty Set the default value to: [100].

CPUFAN Idle-Speed Temperature
Use this item to set CPUFAN idle speed temperature. Fan will run at idle speed when below this pre-set temperature.

CPUFAN Idle-Speed Temperature Set the default value to: [40].
CPUFAN Idle-Speed Duty
Use this item to set CPUFAN idle speed duty. Fan will run at idle speed when below this pre-set duty
CPUFAN Idle-Speed Duty Set the default value to: [40].
▸ **USB Configuration**
Press [Enter] to make settings for the following sub-items:
<u>USB Configuration</u>
XHCI Hand-off
This is a workaround for OSes without XHCI hand-off support. The XHCI ownership change should be claimed by XHCI driver.
The optional settings: [Enabled]; [Disabled].
XHCI Hand-off Set the default value to: [Enabled]
USB Mass Storage Driver Support
Use this item to enable or disable USB Mass storage driver support.
The optional settings: [Disabled]; [Enabled].
USB Mass Storage Driver Support Set the default value to: [Enabled]
<u>USB hardware delay and time-out</u>

USB Transfer time-out
Use this item to set the time-out value for control, bulk, and interrupt transfers.
The optional settings: [1 sec]; [5 sec]; [10 sec]; [20 sec].
 USB Transfer time-out Set the default value to: [20 sec].
Device reset time-out
Use this item to set USB mass storage device start unit command time-out.
The optional settings: [10 sec]; [20 sec]; [30 sec]; [40 sec].
Device reset time-out Set the default value to: [20 sec].
Device power-up delay
Use this item to set maximum time the device will take before it properly reports itself to the host controller. 'Auto' uses default value: for a root port it is 100 ms, for a hub port the delay is taken from hub descriptor.
The optional settings: [Auto]; [Manual].

Device power-up delay Set the default value to: [Auto].

Select **[Manual]** you can set value for the following sub-item: '**Device power-up delay in seconds**'**,** the delay range is 1 .. 40 seconds, in one second increments.

▸ **Network Stack Configuration**

Press [Enter] to go to '**Network Stack**' screen to make further settings.

Network Stack

Use this item to enable or disable UEFI Network Stack.

The optional settings: [Disabled]; [Enabled].

Network Stack Set the default value to: [Disabled].

When set as **[Enabled]**, the following sub-items shall appear:

IPv4 PXE Support

Use this item to enable/disable IPv4 PXE Boot Support. When set as [Disabled], IPv4 PXE boot support will not be available.

The optional settings: [Disabled]; [Enabled].

IPv4 PXE Support Set the default value to: [Enabled].

IPv6 PXE Support

Use this item to enable/disable IPv6 PXE Boot Support. When set as [Disabled], IPv6 PXE boot support will not be available.

The optional settings: [Disabled]; [Enabled].

IPv6 PXE Support Set the default value to: [Disabled].

PXE boot wait time

Wait time in seconds to press [ESC] key to abort the PXE boot.

Use either [+]/[-] or numeric keys to set the value.

PXE boot wait time Set the default value to: [5].

Media detect count

Use this item to set number of times presence of media will be checked.

Use either [+]/[-] or numeric keys to set the value.

Media detect count Set the default value to: [2].

▸ **NVMe Configuration**

Use this item to set NVMe Device options settings.

NVMe Configuration

▶ **Wake-up Function Settings**
Wake-up System With Fixed Time
*This item will only show when **'Wake-up System with Dynamic Time'** is set as [Disabled].*
Use this item to enable or disable system wake-up by RTC alarm. When this function is enabled, system will wake on the time (hr::min::sec) specified.
The optional settings: [Disabled]; [Enabled].
Wake-up System With Fixed Time Set the default value to: [Disabled].
When set as [Enabled], user can make settings in the following items that appear:
Wake-up Hour
Use this item to select 0-23 for example enter 3 for 3am and 15 for 3pm.
Wake-up Hour Set the default value to: [0].
Wake-up Minute
Use this item to select 0-59
Wake-up Minute Set the default value to: [0].
Wake-up Second
Use this item to select 0-59
Wake-up Second Set the default value to: [0].
Wake-up System with Dynamic Time
*This item will only show when **'Wake-up System with Fixed Time'** is set as [Disabled].*
Use this item to enable or disable system wake-up by RTC alarm. When enabled, system will wake on the current time + Increase minute(s).
Wake-up System with Dynamic Time Set the default value to: [Disabled].
When set as [Enabled], user can make settings in the following items that appear:
Wake-up Minute Increase
Use this item to select 1-60 minute(s).
Wake-up Minute Increase Set the default value to: [1].
USB Power Gating S4-S5
USB Wake-up is affected by ERP function in S4. Please disable ERP before

activating this function in S4.

The optional settings: [Disabled]; [Enabled].

USB Power Gating S4-S5 Set the default value to: [Enabled].

PCIE Wake-up from S3-S5

The optional settings: [Disabled]; [Enabled].

PCIE Wake-up from S3-S5 Set the default value to: [Disabled].

▸ **PTT Configuration**

Press [Enter] to make settings for the following sub-items:

PTT Capability/state

TPM Device Selection

TPM Device Selection Set the default value to: [PTT].

3-8 Chipset Menu

```
                           Aptio Setup - AMI
    Main  Advanced  Chipset  Security  Boot  Save & Exit  MEBx

▶ System Agent (SA) Configuration              System Agent (SA) Parameters
▶ PCH-IO Configuration




                                               →←: Select Screen
                                               ↑↓: Select Item
                                               Enter: Select
                                               +/-: Change Opt.
                                               F1: General Help
                                               F2: Previous Values
                                               F3: Optimized Defaults
                                               F4: Save & Exit
                                               ESC: Exit



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```
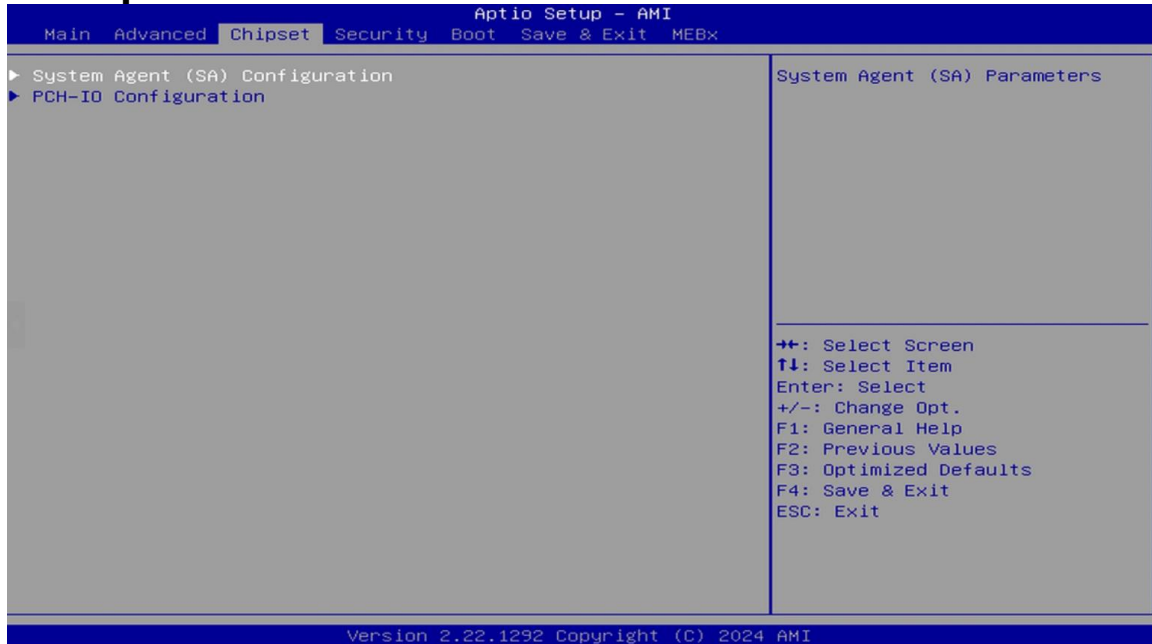
‣ **System Agent (SA) Configuration**
Press [Enter] to make settings for the following sub-items:
System Agent (SA) Configuration
  ► **VMD Setup Menu**
Press [Enter] to view brief information for the working memory module.

‣ **VMD setup menu**
Press [Enter] to make settings for the following sub-items:
Enable VMD controller
Use this item to enable/disable to VMD controller.
The optional settings: [Disabled]; [Enabled].
Enable VMD controller Set the default value to: [Disabled].
When set as [Enabled], the following sub-items shall appear:
Enable VMD Global Mapping
Use this item to enable/disable to VMD global mapping.
The optional settings: [Disabled]; [Enabled].
Enable VMD Global Mapping Set the default value to: [Enabled].
When set as [Disabled], the following sub-items shall appear:
Map this Root Port under VMD
Use this item to Map/UnMap this root port to VMD.
The optional settings: [Disabled]; [Enabled].
Map this Root Port under VMD Set the default value to: [Enabled].
Root Port BDF details
GTT Size
Use this item to select GTT Size.
The optional settings are: [2MB]; [4MB]; [8MB].
GTT Size Set the default value to: [8MB].
DVMT Pre-Allocated
Select DVMT 5.0 Pre-Allocated (Fixed) Graphics Memory size used by the Internal Graphics Device.
The optional settings: [32M]; [64M]; [96M]; [128M]; [160M]; [8M]; [12M]; [16M]; [20M]; [24M]; [28M]; [32M/F7]; [36M]; [40M]; [44M]; [48M]; [52M]; [56M]; [60M].

DVMT Pre-Allocated Set the default value to: [128M].

Active LFP

Use this item to select the Active LFP Configuration.

The optional settings: [Disabled]; [Enabled].

Active LFP Set the default value to: [Disabled]

When set as [Enabled], the following sub-item shall appear:

Panel Type

The optional settings are: [800x480 1ch 18-bit]; [800x600 1ch 18-bit]; [800x600 1ch 24-bit]; [1024x600 1ch 18-bit]; [1024x768 1ch 18-bit]; [1024x768 1ch 24-bit]; [1280x800 1ch 18-bit]; [1280x800 1ch 24-bit]; [1366x768 1ch 18-bit]; [1366x768 1ch 24-bit]; [1440x900 2ch 18-bit]; [1440x900 2ch 24-bit]; [1280x1024 2ch 24-bit]; [1680x1050 2ch 24-bit]; [1920x1080 2ch 24-bit]; [eDP].

Panel Type Set the default value to: [eDP].

Backlight Control

Use this item to make back light control setting.

The optional settings are: [PWM Inverted]; [PWM Normal].

Backlight Control Set the default value to: [PWM Normal]

‣ **PCH-IO Configuration**

Press [Enter] to make settings for the following sub-items:

PCH-IO Configuration

‣ **SATA Configuration**

SATA Device Options Settings.

SATA Configuration

SATA Controller(s)

Use this item to enable/disable SATA Device.

The optional settings are: [Enabled]; [Disabled].

SATA Controller(s) Set the default value to: [Enabled]

When set as [Enabled], the following sub-items shall appear:

M.2

  Port

  Use this item to enable or disable SATA Port.

The optional settings are: [Disabled]; [Enabled].
Port Set the default value to: [Enabled].

Serial Port

Port

Use this item to enable or disable SATA Port.
The optional settings are: [Disabled]; [Enabled].
Port Set the default value to: [Enabled].

HD Audio

Use this item to control detection of the HD-Audio device.
Disabled= HDA will be unconditionally disabled.
Enabled= HDA will be unconditionally enabled.
The optional settings: [Disabled]; [Enabled].
HD Audio Set the default value to: [Enabled].

System State after Power Failure

Use this item to specify what state to go to when power is re-applied after a power failure.
The optional settings: [Always On]; [Always Off]; [Former State].
System State after Power Failure Set the default value to: [Always Off].

3-9 Security Menu
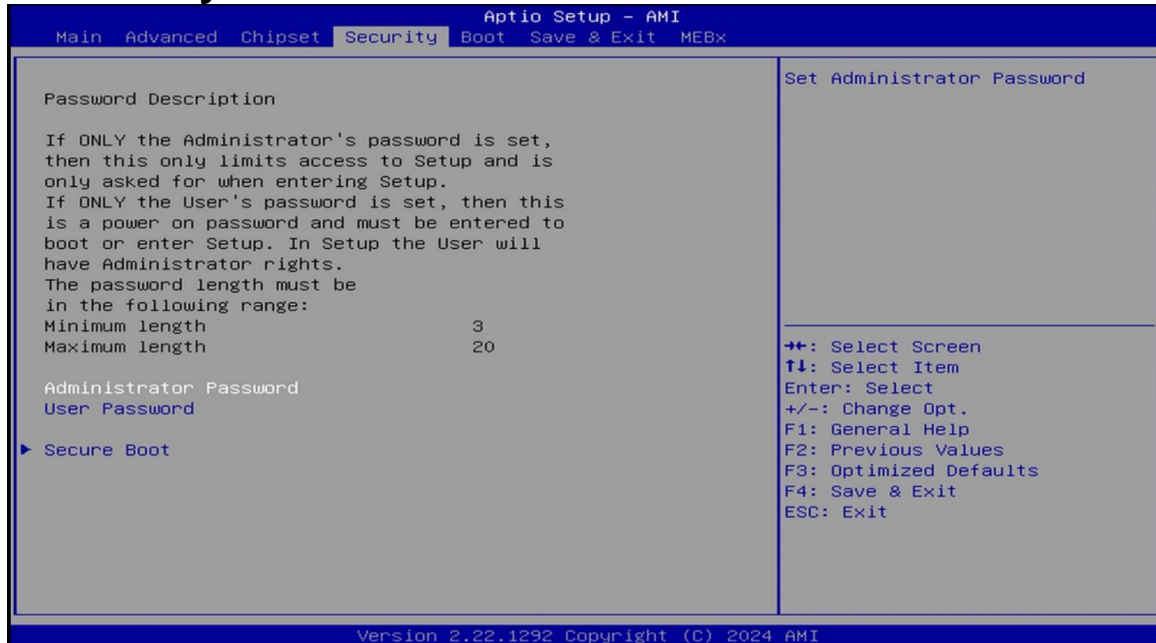
Security menu allow users to change administrator password and user password settings.

Administrator Password

If there is no password present on system, please press [Enter] to create new administrator password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new administrator password.

User Password

If there is no password present on system, please press [Enter] to create new user password. If password is present on system, please press [Enter] to verify old password then to clear/change password. Press again to confirm the new user password.

► **Secure Boot**

Press [Enter] to make customized secure settings:

System Mode

Secure Boot

Secure Boot feature is Active if Secure Boot is Enabled, Platform Key(PK) is enrolled and the System is in User mode. The mode change requires platform reset.

The optional settings: [Disabled]; [Enabled].

Secure Boot Set the default value to: [Enabled].

Secure Boot Mode

Set UEFI Secure Boot Mode to Standard mode or Custom mode. This change is effective after save. After reset, this mode will return to Standard mode.

In Custom mode, Secure Boot Policy variables can be configured by a physically present user without full authentication.

The optional settings: [Standard]; [Custom].

Secure Boot Mode Set the default value to: [Standard].

When set as [**Custom**], user can make further settings in the following items that show up:

► **Restore Factory Keys**

Use this item to force system to User Mode, to install factory default Secure Boot key databases.

► **Reset To Setup Mode**

Use this item to Delete all secure boot key databases from NVRAM.

► **Key Management**

This item enables expert users to modify Secure Boot Policy variables without full authentication, which includes the following items:

Vendor Keys

Factory Key Provision

This item is for user to install factory default Secure Boot keys after the platform reset and while the System is in Setup mode.

The optional settings: [Disabled]; [Enabled].

Factory Key Provision Set the default value to: [Disabled].

‣ **Restore Factory Keys**

Use this item to force system into User Mode. Install factory default Secure Boot key databases.

‣ **Reset To Setup Mode**

Use this item to Delete all Secure Boot key databases from NVRAM.

‣ **Export Secure Boot variables**

Use this item to Copy NVRAM content of Secure Boot variables to files in a root folder on a file system device.

‣ **Enroll Efi Image**

This item allows the image to run in Secure Boot mode.

Enroll SHA256 Hash certificate of a PE image into Authorized Signature Database (db).

‣ **Export Secure Boot variables**

Use this item to save NVRAM content of Secure Boot variables to a file.

‣ **Platform Key(PK)/Key Exchange Keys(KEK)/Authorized Signatures(db)/Forbidden   Signatures(dbx)/ Authorized TimeStamps(dbt)/OsRecovery Signatures(dbr)**

Use this item to enroll Factory Defaults or load certificates from a file:

1. Public Key Certificate:
   a) EFI_SIGNATURE_LIST
   b) EFI_ CERT_X509 (DER)
   c) EFI_ CERT_RSA2048 (bin)
   d) EFI_ CERT_SHAXXX
2. Authenticated UEFI Variable
3. EFI PE/COFF Image (SHA256)

Key Source: Factory, Modified, Mixed.

3-10 Boot Menu

Boot Configuration

Setup Prompt Timeout

Use this item to set number of seconds to wait for setup activation key. 65535 (0xFFFF) means indefinite waiting.

Setup Prompt Timeout Set the default value to: [1].

Bootup NumLock State

Use this item to select keyboard NumLock state.

The optional settings: [On]; [Off].

Bootup NumLock State Set the default value to: [Off].

Quiet Boot

The optional settings: [Disabled]; [Enabled].

Quiet Boot Set the default value to: [Disabled]

Boot Option Priorities
Boot Option #1
Use this item to sets the system boot order
The optional settings: [UEFI: Built-in EFI Shell]; [Disabled].
Boot Option #1 Set the default value to: [UEFI: Built-in EFI Shell].

3-11 Save & Exit Menu

```
                          Aptio Setup — AMI
     Main  Advanced  Chipset  Security  Boot  Save & Exit  MEBx

     Save Changes and Reset
     Discard Changes and Reset

     Restore Defaults
     Save as User Defaults
     Restore User Defaults

     Boot Override
     UEFI: Built—in EFI Shell

                                              →←: Select Screen
                                              ↑↓: Select Item
                                              Enter: Select
                                              +/—: Change Opt.
                                              F1: General Help
                                              F2: Previous Values
                                              F3: Optimized Defaults
                                              F4: Save & Exit
                                              ESC: Exit



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```
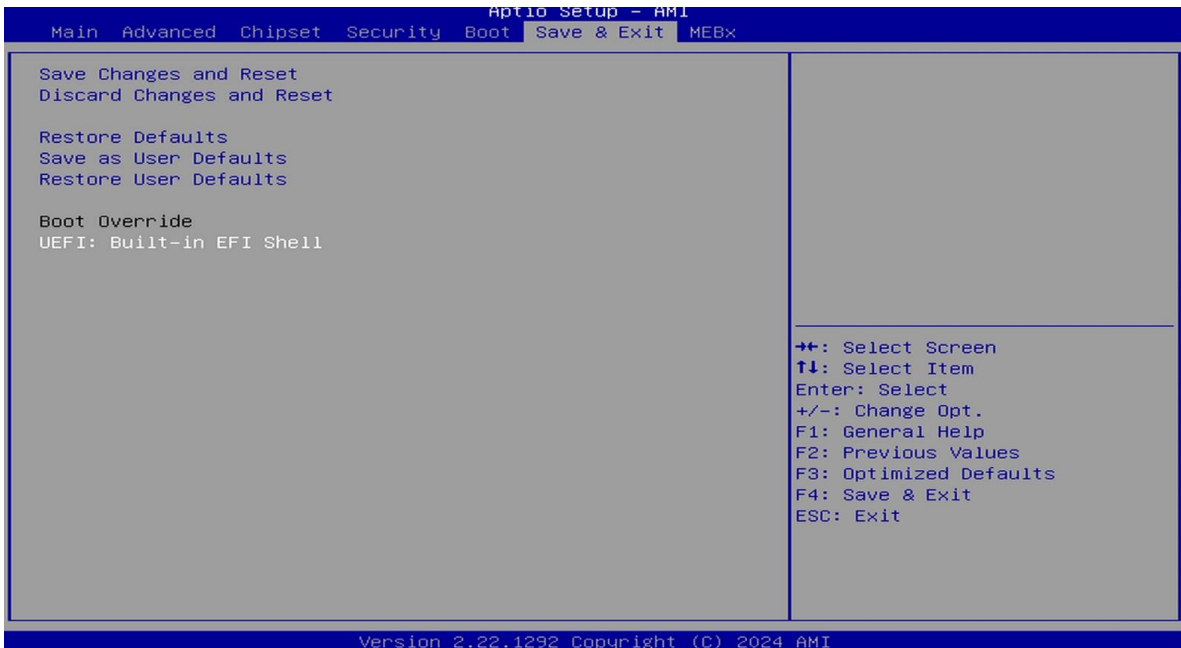
Save Changes and Reset
This item allows user to reset the system after saving the changes.
Discard Changes and Reset
This item allows user to reset the system setup without saving any changes.
Restore Defaults
Use this item to restore /load default values for all the setup options.
Save as User Defaults

Use this item to save the changes done so far as user defaults.

Restore User Defaults

Use this item to restore the user defaults to all the setup options.

__Boot Override__

UEFI: Built-in EFI Shell

Use this item to save configuration and rest.

3-11 MEBx

```
                          Aptio Setup - AMI
   Main  Advanced  Chipset  Security  Boot  Save & Exit  MEBx

   Intel(R) ME Password                              MEBx Login










                                                 →←: Select Screen
                                                 ↑↓: Select Item
                                                 Enter: Select
                                                 +/-: Change Opt.
                                                 F1: General Help
                                                 F2: Previous Values
                                                 F3: Optimized Defaults
                                                 F4: Save & Exit
                                                 ESC: Exit


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```

‣ **Intel(R) ME Password**

  Use this item to MEBx Login.